



## SEQUENCE LISTING

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<110> Bertin, John  
Wang, Weiye  
Blatcher, Maria

<120> NOVEL MOLECULES OF THE NBS/LRR PROTEIN FAMILY AND USES THEREOF

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<140> US 09/986,224  
2001-10-22

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Pro Leu Glu Asp Val Leu Gln Lys Thr Pro Trp Ser Glu Val Glu Glu  
35 40 45  
  
gct gat ggc aag aaa ctg gca gaa att ctg gtc aac acc tcc tca gaa 192  
Ala Asp Gly Lys Lys Leu Ala Glu Ile Leu Val Asn Thr Ser Ser Glu  
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aat tgg ata agg aat gcg act gtg aac atc ttg gaa gag atg aat ctc 240  
Asn Trp Ile Arg Asn Ala Thr Val Asn Ile Leu Glu Glu Met Asn Leu  
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Thr Glu Leu Cys Lys Met Ala Lys Ala Glu Met Met Glu Asp Gly Gln  
85 90 95

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 Val Gln Glu Ile Asp Asn Pro Glu Leu Gly Asp Ala Glu Glu Asp Ser  
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 His Gly Pro Ala Gly Val Gly Lys Thr Thr Leu Ala Lys Lys Cys Met  
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 Tyr Leu Ser Cys Lys Glu Leu Ser Arg Met Gly Pro Cys Ser Phe Ala  
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 225 230 235 240  
 Ile Leu Ala Gln Ala Gln Arg Ile Leu Phe Val Val Asp Gly Leu Asp  
 245 250 255  
 Glu Leu Lys Val Pro Pro Gly Ala Leu Ile Gln Asp Ile Cys Gly Asp  
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Phe	Tyr	Val	Leu	Lys	Ala	Asn	Gln	Ser	Leu	Lys	His	Leu	Arg	Leu	Ser	
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Lys	Lys	Leu	Thr	His	Leu	Cys	Leu	Ala	Lys	Asn	Pro	Ile	Gly	Asp	Thr	
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Gln Leu Ala Tyr Asp Ser Thr Ser Tyr Tyr Ser Ala Asn Asn Leu Asn																
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gtg ttc ctg atg gga gag aga gca tct gga aaa act att gtt ata aat																384
Val Phe Leu Met Gly Glu Arg Ala Ser Gly Lys Thr Ile Val Ile Asn																
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Leu Pro Ser Asn Thr His Lys Asp Arg Tyr Lys Phe Ile His Leu Asn	
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Val Gln Glu Phe Cys Thr Ala Ile Ala Phe Leu Met Ala Val Pro Asn	
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 Lys Glu Glu Leu Ala Asn Val Leu Pro Ile Ser Tyr Glu Gly Gln Tyr  
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 Gln Leu Ala Tyr Asp Ser Thr Ser Tyr Tyr Ser Ala Asn Asn Leu Asn  
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 Val Phe Leu Met Gly Glu Arg Ala Ser Gly Lys Thr Ile Val Ile Asn  
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 Ser Ser Leu Ala Glu Leu Ile Ala Lys Asp Trp Pro Asp Gly Gln Ala  
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 Glu Asp Leu Asp Asn Ile Arg Phe Glu Leu Asn Val Asn Glu Ser Ala  
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 Asp Cys Cys Thr Leu Gln Leu Ser Asn Gly Lys Arg Glu Ile Tyr  
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Asp Arg Asp Pro Glu Lys Leu Thr His His Met Pro Leu Phe Tyr Cys
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Leu Met Glu Val Thr Val Tyr Leu Gln Ser Asp Lys Asp Met Met Val
          530                535                540
Ser Leu Tyr Cys Leu Asp Tyr Cys Cys His Leu Arg Thr Leu Lys Leu
  545                550                555                560
Ser Val Gln Arg Ile Phe Gln Asn Lys Glu Pro Leu Ile Arg Pro Thr
          565                570                575
Ala Ser Gln Met Lys Ser Leu Val Tyr Trp Arg Glu Ile Cys Ser Leu
          580                585                590
Phe Tyr Thr Met Glu Ser Leu Arg Glu Leu His Ile Phe Asp Asn Asp
          595                600                605
Leu Asn Gly Ile Ser Glu Arg Ile Leu Ser Lys Ala Leu Glu His Ser
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Ser Cys Lys Leu Arg Thr Leu
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<212> DNA

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gac cac gta tat atc cgt aat aca tca aag gac gaa cat gag gaa ctg 96  
 Asp His Val Tyr Ile Arg Asn Thr Ser Lys Asp Glu His Glu Glu Leu  
 20 25 30

cag cgc cta ctg gat cct aat agg act aga gcc cag gcc cag acg ata 144  
 Gln Arg Leu Leu Asp Pro Asn Arg Thr Arg Ala Gln Ala Gln Thr Ile  
 35 40 45

gtc ttg gtg ggg agg gca ggg gtt ggg aag acc acc ttg gca atg cag 192  
 Val Leu Val Gly Arg Ala Gly Val Gly Lys Thr Thr Leu Ala Met Gln  
 50 55 60

gct atg ctg cac tgg gca aat gga gtt ctc ttt cag caa agg ttc tcc 240  
 Ala Met Leu His Trp Ala Asn Gly Val Leu Phe Gln Gln Arg Phe Ser  
 65 70 75 80

tat gtt ttc tat ctc agc tgc cat aaa ata agg tac atg aag gaa act 288  
 Tyr Val Phe Tyr Leu Ser Cys His Lys Ile Arg Tyr Met Lys Glu Thr  
 85 90 95

acc ttt gct gaa ttg att tct ttg gat tgg ccc gat ttt gat gcc ccc 336  
 Thr Phe Ala Glu Leu Ile Ser Leu Asp Trp Pro Asp Phe Asp Ala Pro  
 100 105 110

att gaa gag ttc atg tct caa cca gag aag ctc ctg ttt att att gat 384  
 Ile Glu Glu Phe Met Ser Gln Pro Glu Lys Leu Leu Phe Ile Ile Asp  
 115 120 125

ggc ttt gag gaa ata atc ata tct gag tca cgc tct gag agc ttg gat 432  
 Gly Phe Glu Glu Ile Ile Ile Ser Glu Ser Arg Ser Glu Ser Leu Asp  
 130 135 140

gat ggc tcg cca tgt aca gac tgg tac cag gag ctc cca gtg acc aaa 480  
 Asp Gly Ser Pro Cys Thr Asp Trp Tyr Gln Glu Leu Pro Val Thr Lys  
 145 150 155 160

atc cta cac agc ttg ttg aag aaa gaa ttg gtt ccc ctg gct acc tta 528  
 Ile Leu His Ser Leu Leu Lys Lys Glu Leu Val Pro Leu Ala Thr Leu  
 165 170 175

ctg atc acg atc aag acc tgg ttt gtg aga gat ctt aag gcc tca tta 576  
 Leu Ile Thr Ile Lys Thr Trp Phe Val Arg Asp Leu Lys Ala Ser Leu  
 180 185 190

gtg aat cca tgc ttt gta caa att aca ggg ttc aca ggg gac gac cta 624  
 Val Asn Pro Cys Phe Val Gln Ile Thr Gly Phe Thr Gly Asp Asp Leu  
 195 200 205

cgg gta tat ttc atg aga cac ttt gat gac tca agt gaa gtt gag aaa 672  
 Arg Val Tyr Phe Met Arg His Phe Asp Asp Ser Ser Glu Val Glu Lys  
 210 215 220

atc ctg cag cag cta aga aaa aac gaa act ctc ttt cat tcc tgc agt Ile Leu Gln Gln Leu Arg Lys Asn Glu Thr Leu Phe His Ser Cys Ser 225 230 235 240	720
gcc ccc atg gtg tgt tgg acc gta tgt tcc tgt ctg aag cag ccg aag Ala Pro Met Val Cys Trp Thr Val Cys Ser Cys Leu Lys Gln Pro Lys 245 250 255	768
gtg agg tat tac gat ctc cag tca atc act cag act acc acc agt ctg Val Arg Tyr Tyr Asp Leu Gln Ser Ile Thr Gln Thr Thr Ser Leu 260 265 270	816
tat gcc tat ttt ttc tcc aac ttg ttc tcc aca gca gag gta gat ttg Tyr Ala Tyr Phe Phe Ser Asn Leu Phe Ser Thr Ala Glu Val Asp Leu 275 280 285	864
gca gat gac agc tgg cca gga caa tgg agg gcc ctc tgc agt ctg gcc Ala Asp Asp Ser Trp Pro Gly Gln Trp Arg Ala Leu Cys Ser Leu Ala 290 295 300	912
ata gaa ggg ctg tgg tct atg aac ttc acg ttt aac aaa gaa gac act Ile Glu Gly Leu Trp Ser Met Asn Phe Thr Phe Asn Lys Glu Asp Thr 305 310 315 320	960
gag atc gag ggc ctg gaa gtg cct ttc att gat tct ctc tac gag ttc Glu Ile Glu Gly Leu Glu Val Pro Phe Ile Asp Ser Leu Tyr Glu Phe 325 330 335	1008
aat att ctt caa aag atc aat gac tgt ggg ggt tgc act act ttc acc Asn Ile Leu Gln Lys Ile Asn Asp Cys Gly Gly Cys Thr Thr Phe Thr 340 345 350	1056
cac cta agt ttc cag gag ttt ttt gca gcc atg tcc ttt gtg cta gag His Leu Ser Phe Gln Glu Phe Phe Ala Ala Met Ser Phe Val Leu Glu 355 360 365	1104
gaa cct aga gaa ttc cct ccc cat tcc aca aag cca caa gag atg aag Glu Pro Arg Glu Phe Pro Pro His Ser Thr Lys Pro Gln Glu Met Lys 370 375 380	1152
atg tta ctg caa cac gtc ttg ctt gac aaa gaa gcc tac tgg act cca Met Leu Leu Gln His Val Leu Leu Asp Lys Glu Ala Tyr Trp Thr Pro 385 390 395 400	1200
gtg gtt ctg ttc ttc ttt ggt ctt tta aat aaa aac ata gca aga gaa Val Val Leu Phe Phe Phe Gly Leu Leu Asn Lys Asn Ile Ala Arg Glu 405 410 415	1248
ctg gaa gat act ttg cat tgt aaa ata tct ccc agg gta atg gag gaa Leu Glu Asp Thr Leu His Cys Lys Ile Ser Pro Arg Val Met Glu Glu 420 425 430	1296
tta tta aag tgg gga gaa gag tta ggt aag gct gaa agt gcc tct ctc Leu Leu Lys Trp Gly Glu Glu Leu Gly Lys Ala Glu Ser Ala Ser Leu 435 440 445	1344

caa ttt cac att cta cga ctt ttt cac tgc cta cac gag tcc cag gag 1392  
 Gln Phe His Ile Leu Arg Leu Phe His Cys Leu His Glu Ser Gln Glu  
 450 455 460  
 gaa gac ttc aca aag aag atg ttg ggt cgt atc ttt gaa gtt gac ctt 1440  
 Glu Asp Phe Thr Lys Lys Met Leu Gly Arg Ile Phe Glu Val Asp Leu  
 465 470 475 480  
 aat att ttg gag gac gaa gaa ctc caa gct tct tca ttt tgc cta aag 1488  
 Asn Ile Leu Glu Asp Glu Glu Leu Gln Ala Ser Ser Phe Cys Leu Lys  
 485 490 495  
 cac tgt aaa agg tta aat aag cta agg ctt tct gtt agc agt cac atc 1536  
 His Cys Lys Arg Leu Asn Lys Leu Arg Leu Ser Val Ser Ser His Ile  
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 <212> PRT  
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 Gln Arg Leu Leu Asp Pro Asn Arg Thr Arg Ala Gln Ala Gln Thr Ile  
 35 40 45  
 Val Leu Val Gly Arg Ala Gly Val Gly Lys Thr Thr Leu Ala Met Gln  
 50 55 60  
 Ala Met Leu His Trp Ala Asn Gly Val Leu Phe Gln Gln Arg Phe Ser  
 65 70 75 80  
 Tyr Val Phe Tyr Leu Ser Cys His Lys Ile Arg Tyr Met Lys Glu Thr  
 85 90 95  
 Thr Phe Ala Glu Leu Ile Ser Leu Asp Trp Pro Asp Phe Asp Ala Pro  
 100 105 110  
 Ile Glu Glu Phe Met Ser Gln Pro Glu Lys Leu Leu Phe Ile Ile Asp  
 115 120 125  
 Gly Phe Glu Glu Ile Ile Ile Ser Glu Ser Arg Ser Glu Ser Leu Asp  
 130 135 140  
 Asp Gly Ser Pro Cys Thr Asp Trp Tyr Gln Glu Leu Pro Val Thr Lys  
 145 150 155 160  
 Ile Leu His Ser Leu Leu Lys Lys Glu Leu Val Pro Leu Ala Thr Leu  
 165 170 175  
 Leu Ile Thr Ile Lys Thr Trp Phe Val Arg Asp Leu Lys Ala Ser Leu  
 180 185 190  
 Val Asn Pro Cys Phe Val Gln Ile Thr Gly Phe Thr Gly Asp Asp Leu  
 195 200 205  
 Arg Val Tyr Phe Met Arg His Phe Asp Asp Ser Ser Glu Val Glu Lys  
 210 215 220  
 Ile Leu Gln Gln Leu Arg Lys Asn Glu Thr Leu Phe His Ser Cys Ser  
 225 230 235 240

Ala Pro Met Val Cys Trp Thr Val Cys Ser Cys Leu Lys Gln Pro Lys  
245 250 255  
Val Arg Tyr Tyr Asp Leu Gln Ser Ile Thr Gln Thr Thr Thr Ser Leu  
260 265 270  
Tyr Ala Tyr Phe Phe Ser Asn Leu Phe Ser Thr Ala Glu Val Asp Leu  
275 280 285  
Ala Asp Asp Ser Trp Pro Gly Gln Trp Arg Ala Leu Cys Ser Leu Ala  
290 295 300  
Ile Glu Gly Leu Trp Ser Met Asn Phe Thr Phe Asn Lys Glu Asp Thr  
305 310 315 320  
Glu Ile Glu Gly Leu Glu Val Pro Phe Ile Asp Ser Leu Tyr Glu Phe  
325 330 335  
Asn Ile Leu Gln Lys Ile Asn Asp Cys Gly Gly Cys Thr Thr Phe Thr  
340 345 350  
His Leu Ser Phe Gln Glu Phe Phe Ala Ala Met Ser Phe Val Leu Glu  
355 360 365  
Glu Pro Arg Glu Phe Pro Pro His Ser Thr Lys Pro Gln Glu Met Lys  
370 375 380  
Met Leu Leu Gln His Val Leu Leu Asp Lys Glu Ala Tyr Trp Thr Pro  
385 390 395 400  
Val Val Leu Phe Phe Phe Gly Leu Leu Asn Lys Asn Ile Ala Arg Glu  
405 410 415  
Leu Glu Asp Thr Leu His Cys Lys Ile Ser Pro Arg Val Met Glu Glu  
420 425 430  
Leu Leu Lys Trp Gly Glu Glu Leu Gly Lys Ala Glu Ser Ala Ser Leu  
435 440 445  
Gln Phe His Ile Leu Arg Leu Phe His Cys Leu His Glu Ser Gln Glu  
450 455 460  
Glu Asp Phe Thr Lys Lys Met Leu Gly Arg Ile Phe Glu Val Asp Leu  
465 470 475 480  
Asn Ile Leu Glu Asp Glu Glu Leu Gln Ala Ser Ser Phe Cys Leu Lys  
485 490 495  
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gag gag gaa gtc aag caa gaa gaa tgt gac cat ttg gac cgc ctt ttt 97  
Glu Glu Glu Val Lys Gln Glu Glu Cys Asp His Leu Asp Arg Leu Phe  
20 25 30

gct ccc aag gaa gct ggg aaa cag cca cgt aca gtg atc att caa gga Ala Pro Lys Glu Ala Gly Lys Gln Pro Arg Thr Val Ile Ile Gln Gly	145
35 40 45	
cca caa gga att gga aaa acg aca ctc ctg atg aag ctg atg atg gcc Pro Gln Gly Ile Gly Lys Thr Thr Leu Leu Met Lys Leu Met Met Ala	193
50 55 60	
tgg tcg gac aac aag atc ttt cgg gat agg ttc ctg tac acg ttc tat Trp Ser Asp Asn Lys Ile Phe Arg Asp Arg Phe Leu Tyr Thr Phe Tyr	241
65 70 75 80	
ttc tgc tgc aga gaa ctg agg gag ttg ccg cca acg agt ttg gct gac Phe Cys Cys Arg Glu Leu Arg Glu Leu Pro Pro Thr Ser Leu Ala Asp	289
85 90 95	
ttg att tcc aga gag tgg cct gac ccc gct gct cct ata aca gag atc Leu Ile Ser Arg Glu Trp Pro Asp Pro Ala Ala Pro Ile Thr Glu Ile	337
100 105 110	
gtg tct caa ccg gag aga ctc ttg ttc gtc atc gac agc ttc gaa gag Val Ser Gln Pro Glu Arg Leu Leu Phe Val Ile Asp Ser Phe Glu Glu	385
115 120 125	
ctg cag ggc ggc ttg aac gaa ccc gat tcg gat ctg tgt ggt gac ttg Leu Gln Gly Gly Leu Asn Glu Pro Asp Ser Asp Leu Cys Gly Asp Leu	433
130 135 140	
atg gag aaa ccg ccg gtg cag gtg ctt ctg agc agt ttg ctg agg aag Met Glu Lys Arg Pro Val Gln Val Leu Leu Ser Ser Leu Leu Arg Lys	481
145 150 155 160	
aag atg ctc ccg gag gcc tcc ctg ctc atc gct atc aaa ccc gtg tgc Lys Met Leu Pro Glu Ala Ser Leu Leu Ile Ala Ile Lys Pro Val Cys	529
165 170 175	
ccg aag gag ctc ccg gat cag gtg acg atc tca gaa atc tac cag ccc Pro Lys Glu Leu Arg Asp Gln Val Thr Ile Ser Glu Ile Tyr Gln Pro	577
180 185 190	
ccg gga ttc aac gag agt gat agg tta gtg tat ttc tgc tgt ttc ttc Arg Gly Phe Asn Glu Ser Asp Arg Leu Val Tyr Phe Cys Cys Phe Phe	625
195 200 205	
aaa gac ccg aaa aga gcc atg gaa gcc ttc aat ctt gta aga gaa agt Lys Asp Pro Lys Arg Ala Met Glu Ala Phe Asn Leu Val Arg Glu Ser	673
210 215 220	
gaa cag ctg ttt tcc ata tgc caa atc ccg ctc ctc tgc tgg atc ctg Glu Gln Leu Phe Ser Ile Cys Gln Ile Pro Leu Leu Cys Trp Ile Leu	721
225 230 235 240	
tgt acc agt ctg aag caa gag atg cag aaa gga aaa gac ctg gcc ctg Cys Thr Ser Leu Lys Gln Glu Met Gln Lys Gly Lys Asp Leu Ala Leu	769
245 250 255	



acc tgc cag agc act acc tct gtg tac tcc tct ttc gtc ttt aac ctg	817
Thr Cys Gln Ser Thr Thr Ser Val Tyr Ser Ser Phe Val Phe Asn Leu	
260 265 270	
ttc aca cct gag ggt gcc gag ggc ccg act ccg caa acc cag cac cag	865
Phe Thr Pro Glu Gly Ala Glu Gly Pro Thr Pro Gln Thr Gln His Gln	
275 280 285	
ctg aag gcc ctg tgc tcc ctg gct gca gag ggt atg tgg aca gac aca	913
Leu Lys Ala Leu Cys Ser Leu Ala Ala Glu Gly Met Trp Thr Asp Thr	
290 295 300	
ttt gag ttt tgt gaa gac gac ctc ccg aga aat ggg gtt gtt gac gct	961
Phe Glu Phe Cys Glu Asp Asp Leu Arg Arg Asn Gly Val Val Asp Ala	
305 310 315 320	
gac atc cct gcg ctg ctg ggc acc aag ata ctt ctg aag tac ggg gag	1009
Asp Ile Pro Ala Leu Leu Gly Thr Lys Ile Leu Leu Lys Tyr Gly Glu	
325 330 335	
cgt gag agc tcc tac gtg ttc ctc cac gtg tgt atc cag gag ttc tgt	1057
Arg Glu Ser Ser Tyr Val Phe Leu His Val Cys Ile Gln Glu Phe Cys	
340 345 350	
gcc gcc ttg ttc tat ttg ctc aag agc cac ctt gat cat cct cac cca	1105
Ala Ala Leu Phe Tyr Leu Leu Lys Ser His Leu Asp His Pro His Pro	
355 360 365	
gct gtg aga tgt gta cag gaa ttg cta gtt gcc aat ttt gaa aaa gca	1153
Ala Val Arg Cys Val Gln Glu Leu Leu Val Ala Asn Phe Glu Lys Ala	
370 375 380	
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Arg Arg Ala His Trp Ile Phe Leu Gly Cys Phe Leu Thr Gly Leu Leu	
385 390 395 400	
aat aaa aag gaa caa gaa aaa ctg gat gcg ttt ttt ggc ttc caa ctg	1249
Asn Lys Lys Glu Gln Glu Lys Leu Asp Ala Phe Phe Gly Phe Gln Leu	
405 410 415	
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Ser Gln Glu Ile Lys Gln Gln Ile His Gln Cys Leu Lys Ser Leu Gly	
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gag cgt ggc aat cct cag gga cag gtg gat tcc ttg gcg ata ttt tac	1345
Glu Arg Gly Asn Pro Gln Gly Gln Val Asp Ser Leu Ala Ile Phe Tyr	
435 440 445	
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Cys Leu Phe Glu Met Gln Asp Pro Ala Phe Val Lys Gln Ala Val Asn	
450 455 460	
ctc ctc caa gaa gct aac ttt cat att att gac aac gtg gac ttg gtg	1441
Leu Leu Gln Glu Ala Asn Phe His Ile Ile Asp Asn Val Asp Leu Val	
465 470 475 480	

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acc agc ggg cac ctc aga gag ctc cag gtg cag gac agc acc ctc agc Thr Ser Gly His Leu Arg Glu Leu Gln Val Gln Asp Ser Thr Leu Ser 530 535 540	1633
gag tcg acc ttt gtg acc tgg tgt aac cag ctg agg cat ccc agc tgt Glu Ser Thr Phe Val Thr Trp Cys Asn Gln Leu Arg His Pro Ser Cys 545 550 555 560	1681
cgc ctt cag aag ctt gga ata aat aac gtt tcc ttt tct ggc cag agt Arg Leu Gln Lys Leu Gly Ile Asn Asn Val Ser Phe Ser Gly Gln Ser 565 570 575	1729
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gat gcc ttg aac tac cca gca ggc aac gtc aaa gag cta gcg ctg gta Asp Ala Leu Asn Tyr Pro Ala Gly Asn Val Lys Glu Leu Ala Leu Val 610 615 620	1873
aat tgt cac ctc tca ccc att gat tgt gaa gtc ctt gct ggc ctt cta Asn Cys His Leu Ser Pro Ile Asp Cys Glu Val Leu Ala Gly Leu Leu 625 630 635 640	1921
acc aac aac aag aag ctg acg tat ctg aat gta tcc tgc aac cag tta Thr Asn Asn Lys Lys Leu Thr Tyr Leu Asn Val Ser Cys Asn Gln Leu 645 650 655	1969
gac aca ggc gtg ccc ctt ttg tgt gaa gcc ctg tgc agc cca gac acg Asp Thr Gly Val Pro Leu Leu Cys Glu Ala Leu Cys Ser Pro Asp Thr 660 665 670	2017
gtc ctg gta tac ctg atg ttg gct ttc tgc cac ctc agc gag cag tgc Val Leu Val Tyr Leu Met Leu Ala Phe Cys His Leu Ser Glu Gln Cys 675 680 685	2065
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			20					25					30		
Ala	Pro	Lys	Glu	Ala	Gly	Lys	Gln	Pro	Arg	Thr	Val	Ile	Ile	Gln	Gly
		35				40						45			
Pro	Gln	Gly	Ile	Gly	Lys	Thr	Leu	Leu	Met	Lys	Leu	Met	Met	Ala	
	50				55					60					
Trp	Ser	Asp	Asn	Lys	Ile	Phe	Arg	Asp	Arg	Phe	Leu	Tyr	Thr	Phe	Tyr
65				70						75					80

Phe	Cys	Cys	Arg	Glu	Leu	Arg	Glu	Leu	Pro	Pro	Thr	Ser	Leu	Ala	Asp		
				85					90					95			
Leu	Ile	Ser	Arg	Glu	Trp	Pro	Asp	Pro	Ala	Ala	Pro	Ile	Thr	Glu	Ile		
			100					105					110				
Val	Ser	Gln	Pro	Glu	Arg	Leu	Leu	Phe	Val	Ile	Asp	Ser	Phe	Glu	Glu		
		115					120					125					
Leu	Gln	Gly	Gly	Leu	Asn	Glu	Pro	Asp	Ser	Asp	Leu	Cys	Gly	Asp	Leu		
	130					135				140							
Met	Glu	Lys	Arg	Pro	Val	Gln	Val	Leu	Leu	Ser	Ser	Leu	Leu	Arg	Lys		
145					150					155					160		
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			165						170					175			
Pro	Lys	Glu	Leu	Arg	Asp	Gln	Val	Thr	Ile	Ser	Glu	Ile	Tyr	Gln	Pro		
			180					185					190				
Arg	Gly	Phe	Asn	Glu	Ser	Asp	Arg	Leu	Val	Tyr	Phe	Cys	Cys	Phe	Phe		
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Lys	Asp	Pro	Lys	Arg	Ala	Met	Glu	Ala	Phe	Asn	Leu	Val	Arg	Glu	Ser		
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Glu	Gln	Leu	Phe	Ser	Ile	Cys	Gln	Ile	Pro	Leu	Leu	Cys	Trp	Ile	Leu		
225					230				235						240		
Cys	Thr	Ser	Leu	Lys	Gln	Glu	Met	Gln	Lys	Gly	Lys	Asp	Leu	Ala	Leu		
			245						250					255			
Thr	Cys	Gln	Ser	Thr	Thr	Ser	Val	Tyr	Ser	Ser	Phe	Val	Phe	Asn	Leu		
		260						265					270				
Phe	Thr	Pro	Glu	Gly	Ala	Glu	Gly	Pro	Thr	Pro	Gln	Thr	Gln	His	Gln		
	275						280					285					
Leu	Lys	Ala	Leu	Cys	Ser	Leu	Ala	Ala	Glu	Gly	Met	Trp	Thr	Asp	Thr		
	290					295					300						
Phe	Glu	Phe	Cys	Glu	Asp	Asp	Leu	Arg	Arg	Asn	Gly	Val	Val	Asp	Ala		
305					310					315					320		
Asp	Ile	Pro	Ala	Leu	Leu	Gly	Thr	Lys	Ile	Leu	Leu	Lys	Tyr	Gly	Glu		
			325						330					335			
Arg	Glu	Ser	Ser	Tyr	Val	Phe	Leu	His	Val	Cys	Ile	Gln	Glu	Phe	Cys		
			340					345					350				
Ala	Ala	Leu	Phe	Tyr	Leu	Leu	Lys	Ser	His	Leu	Asp	His	Pro	His	Pro		
	355						360					365					
Ala	Val	Arg	Cys	Val	Gln	Glu	Leu	Leu	Val	Ala	Asn	Phe	Glu	Lys	Ala		
	370					375					380						
Arg	Arg	Ala	His	Trp	Ile	Phe	Leu	Gly	Cys	Phe	Leu	Thr	Gly	Leu	Leu		
385					390					395					400		
Asn	Lys	Lys	Glu	Gln	Glu	Lys	Leu	Asp	Ala	Phe	Phe	Gly	Phe	Gln	Leu		
			405						410					415			
Ser	Gln	Glu	Ile	Lys	Gln	Gln	Ile	His	Gln	Cys	Leu	Lys	Ser	Leu	Gly		
		420						425					430				
Glu	Arg	Gly	Asn	Pro	Gln	Gly	Gln	Val	Asp	Ser	Leu	Ala	Ile	Phe	Tyr		
	435					440						445					
Cys	Leu	Phe	Glu	Met	Gln	Asp	Pro	Ala	Phe	Val	Lys	Gln	Ala	Val	Asn		
	450					455					460						
Leu	Leu	Gln	Glu	Ala	Asn	Phe	His	Ile	Ile	Asp	Asn	Val	Asp	Leu	Val		
465					470					475					480		
Val	Ser	Ala	Tyr	Cys	Leu	Lys	Tyr	Cys	Ser	Ser	Leu	Arg	Lys	Leu	Cys		
			485						490					495			
Phe	Ser	Val	Gln	Asn	Val	Phe	Lys	Lys	Glu	Asp	Glu	His	Ser	Ser	Thr		
		500						505					510				
Ser	Asp	Tyr	Ser	Leu	Ile	Cys	Trp	His	His	Ile	Cys	Ser	Val	Leu	Thr		
		515					520					525					

Thr	Ser	Gly	His	Leu	Arg	Glu	Leu	Gln	Val	Gln	Asp	Ser	Thr	Leu	Ser
530						535					540				
Glu	Ser	Thr	Phe	Val	Thr	Trp	Cys	Asn	Gln	Leu	Arg	His	Pro	Ser	Cys
545					550					555					560
Arg	Leu	Gln	Lys	Leu	Gly	Ile	Asn	Asn	Val	Ser	Phe	Ser	Gly	Gln	Ser
			565						570					575	
Val	Leu	Leu	Phe	Glu	Val	Leu	Phe	Tyr	Gln	Pro	Asp	Leu	Lys	Tyr	Leu
			580					585					590		
Ser	Phe	Thr	Leu	Thr	Lys	Leu	Ser	Arg	Asp	Asp	Ile	Arg	Ser	Leu	Cys
	595						600					605			
Asp	Ala	Leu	Asn	Tyr	Pro	Ala	Gly	Asn	Val	Lys	Glu	Leu	Ala	Leu	Val
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Asn	Cys	His	Leu	Ser	Pro	Ile	Asp	Cys	Glu	Val	Leu	Ala	Gly	Leu	Leu
625					630					635					640
Thr	Asn	Asn	Lys	Lys	Leu	Thr	Tyr	Leu	Asn	Val	Ser	Cys	Asn	Gln	Leu
			645						650					655	
Asp	Thr	Gly	Val	Pro	Leu	Leu	Cys	Glu	Ala	Leu	Cys	Ser	Pro	Asp	Thr
		660						665					670		
Val	Leu	Val	Tyr	Leu	Met	Leu	Ala	Phe	Cys	His	Leu	Ser	Glu	Gln	Cys
	675						680				685				
Cys	Glu	Tyr	Ile	Ser	Glu	Met	Leu	Leu	Arg	Asn	Lys	Ser	Val	Arg	Tyr
690						695				700					
Leu	Asp	Leu	Ser	Ala	Asn	Val	Leu	Lys	Asp	Glu	Gly	Leu	Lys	Thr	Leu
705					710					715					720
Cys	Glu	Ala	Leu	Lys	His	Pro	Asp	Cys	Cys	Leu	Asp	Ser	Leu	Cys	Leu
			725						730					735	
Val	Lys	Cys	Phe	Ile	Thr	Ala	Ala	Gly	Cys	Glu	Asp	Leu	Ala	Ser	Ala
		740						745				750			
Leu	Ile	Ser	Asn	Gln	Asn	Leu	Lys	Ile	Leu	Gln	Ile	Gly	Cys	Asn	Glu
	755						760					765			
Ile	Gly	Asp	Val	Gly	Val	Gln	Leu	Leu	Cys	Arg	Ala	Leu	Thr	His	Thr
770						775					780				
Asp	Cys	Arg	Leu	Glu	Ile	Leu	Gly	Leu	Glu	Glu	Cys	Gly	Leu	Thr	Ser
785					790					795					800
Thr	Cys	Cys	Lys	Asp	Leu	Ala	Ser	Val	Leu	Thr	Cys	Ser	Lys	Thr	Leu
			805						810					815	
Gln	Gln	Leu	Asn	Leu	Thr	Leu	Asn	Thr	Leu	Asp	His	Thr	Gly	Val	Val
		820						825					830		
Val	Leu	Cys	Glu	Ala	Leu	Arg	His	Pro	Glu	Cys	Ala	Leu	Gln	Val	Leu
		835					840					845			
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850						855									

&lt;210&gt; 9

&lt;211&gt; 15

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 9

Ile Val Gly Met Gly Gly Ile Gly Lys Thr Thr Leu Ala Lys Gln

1

5

10

15

&lt;210&gt; 10

&lt;211&gt; 28

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 10

Asn Pro Ser Leu Arg Glu Leu Asp Leu Ser Asn Asn Lys Leu Gly Asp  
 1 5 10 15  
 Glu Gly Ala Arg Ala Leu Ala Glu Ala Leu Lys Ser  
 20 25

&lt;210&gt; 11

&lt;211&gt; 28

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 11

Ile Val Gly Met Gly Gly Ile Gly Lys Thr Thr Leu Ala Lys Gln Ile  
 1 5 10 15  
 Tyr Asn Asp Glu Ser Gln Glu Val Gln Arg His Phe  
 20 25

&lt;210&gt; 12

&lt;211&gt; 3263

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (59)...(2998)

&lt;400&gt; 12

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 Met Thr Ser Pro Gln Leu Glu Trp Thr Leu Gln Thr Leu Leu Glu Gln  
 1 5 10 15

ctg aac gag gat gaa tta aag agt ttc aaa tcc ctt tta tgg gct ttt 154  
 Leu Asn Glu Asp Glu Leu Lys Ser Phe Lys Ser Leu Leu Trp Ala Phe  
 20 25 30

ccc ctc gaa gac gtg cta cag aag acc cca tgg tct gag gtg gaa gag 202  
 Pro Leu Glu Asp Val Leu Gln Lys Thr Pro Trp Ser Glu Val Glu Glu  
 35 40 45

gct gat ggc aag aaa ctg gca gaa att ctg gtc aac acc tcc tca gaa 250  
 Ala Asp Gly Lys Lys Leu Ala Glu Ile Leu Val Asn Thr Ser Ser Glu  
 50 55 60

aat tgg ata agg aat gcg act gtg aac atc ttg gaa gag atg aat ctc 298  
 Asn Trp Ile Arg Asn Ala Thr Val Asn Ile Leu Glu Glu Met Asn Leu  
 65 70 75 80

acg gaa ttg tgt aag atg gca aag gct gag atg atg gag gac gga cag 346  
 Thr Glu Leu Cys Lys Met Ala Lys Ala Glu Met Met Glu Asp Gly Gln  
 85 90 95

gtg caa gaa ata gat aat cct gag ctg gga gat gca gaa gaa gac tcg 394  
 Val Gln Glu Ile Asp Asn Pro Glu Leu Gly Asp Ala Glu Glu Asp Ser  
 100 105 110

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aaa cag tct ttg gtc tgg aag aac acc ttt tgg caa gga gac att gac Lys Gln Ser Leu Val Trp Lys Asn Thr Phe Trp Gln Gly Asp Ile Asp 130 135 140	490
aat ttc cat gac gac gtc act ctg aga aac caa cgg ttc att cca ttc Asn Phe His Asp Asp Val Thr Leu Arg Asn Gln Arg Phe Ile Pro Phe 145 150 155 160	538
ttg aat ccc aga aca ccc agg aag cta aca cct tac acg gtg gtg ctg Leu Asn Pro Arg Thr Pro Arg Lys Leu Thr Pro Tyr Thr Val Val Leu 165 170 175	586
cac ggc ccc gca ggc gtg ggg aaa acc acg ctg gcc aaa aag tgt atg His Gly Pro Ala Gly Val Gly Lys Thr Thr Leu Ala Lys Lys Cys Met 180 185 190	634
ctg gac tgg aca gac tgc aac ctc agc ccg acg ctc aga tac gcg ttc Leu Asp Trp Thr Asp Cys Asn Leu Ser Pro Thr Leu Arg Tyr Ala Phe 195 200 205	682
tac ctc agc tgc aag gag ctc agc cgc atg ggc ccc tgc agt ttt gca Tyr Leu Ser Cys Lys Glu Leu Ser Arg Met Gly Pro Cys Ser Phe Ala 210 215 220	730
gag ctg atc tcc aaa gac tgg cct gaa ttg cag gat gac att cca agc Glu Leu Ile Ser Lys Asp Trp Pro Glu Leu Gln Asp Asp Ile Pro Ser 225 230 235 240	778
atc cta gcc caa gca cag aga atc ctg ttc gtg gtc gat ggc ctt gat Ile Leu Ala Gln Ala Gln Arg Ile Leu Phe Val Val Asp Gly Leu Asp 245 250 255	826
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tgg gag aag aag aag ccg gtg ccc gtc ctc ctg ggg agt ttg ctg aag Trp Glu Lys Lys Lys Pro Val Pro Val Leu Leu Gly Ser Leu Leu Lys 275 280 285	922
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gca ctg agg gac ctc cag ctc ctg gcg cag cag ccg atc tac gta agg Ala Leu Arg Asp Leu Gln Leu Leu Ala Gln Gln Pro Ile Tyr Val Arg 305 310 315 320	1018
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tcc ttc atc cac ctc agc ttc cag cag ttt ctc act gcc ctg ttc tac Ser Phe Ile His Leu Ser Phe Gln Gln Phe Leu Thr Ala Leu Phe Tyr 465 470 475 480	1498
gcc ctg gag aag gag gag ggg gag gac agg gac ggc cac gcc tgg gac Ala Leu Glu Lys Glu Glu Gly Glu Asp Arg Asp Gly His Ala Trp Asp 485 490 495	1546
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Lys Pro Leu Ser Val Thr Asp Leu Lys Glu Val Leu Gly Cys Leu Tyr	
565 570 575	
 gag tct cag gag gag gag ctg gcg aag gtg gtg gtg gcc ccg ttc aag	1834
Glu Ser Gln Glu Glu Leu Ala Lys Val Val Val Ala Pro Phe Lys	
580 585 590	
 gaa att tct att cac ctg aca aat act tct gaa gtg atg cat tgt tcc	1882
Glu Ile Ser Ile His Leu Thr Asn Thr Ser Glu Val Met His Cys Ser	
595 600 605	
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Phe Ser Leu Lys His Cys Gln Asp Leu Gln Lys Leu Ser Leu Gln Val	
610 615 620	
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Ala Lys Gly Val Phe Leu Glu Asn Tyr Met Asp Phe Glu Leu Asp Ile	
625 630 635 640	
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Glu Phe Glu Arg Cys Thr Tyr Leu Thr Ile Pro Asn Trp Ala Arg Gln	
645 650 655	
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Asp Leu Arg Ser Leu Arg Leu Trp Thr Asp Phe Cys Ser Leu Phe Ser	
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 tca aac agc aac ctc aag ttt ctg gaa gtg aaa caa agc ttc ctg agt	2122
Ser Asn Ser Asn Leu Lys Phe Leu Glu Val Lys Gln Ser Phe Leu Ser	
675 680 685	
 gac tct tct gtg cgg att ctt tgt gac cac gta acc cgt agc acc tgt	2170
Asp Ser Ser Val Arg Ile Leu Cys Asp His Val Thr Arg Ser Thr Cys	
690 695 700	
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His Leu Gln Lys Val Glu Ile Lys Asn Val Thr Pro Asp Thr Ala Tyr	
705 710 715 720	
 cgg gac ttc tgt ctt gct ttc att ggg aag aag acc ctc acg cac ctg	2266
Arg Asp Phe Cys Leu Ala Phe Ile Gly Lys Lys Thr Leu Thr His Leu	
725 730 735	
 acc ctg gca ggg cac atc gag tgg gaa cgc acg atg atg ctg atg ctg	2314
Thr Leu Ala Gly His Ile Glu Trp Glu Arg Thr Met Met Leu Met Leu	
740 745 750	
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Cys Asp Leu Leu Arg Asn His Lys Cys Asn Leu Gln Tyr Leu Arg Leu	
755 760 765	
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770 775 780	

ctc aaa gcc aac cag tcc ctg aag cac ctg cgt ctc tca gcc aat gtg Leu Lys Ala Asn Gln Ser Leu Lys His Leu Arg Leu Ser Ala Asn Val 785 790 795 800	2458
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gcc agt tgc aag gac ctt gct gct gtc ttg gtt gtc agc aag aag ctg Ala Ser Cys Lys Asp Leu Ala Val Leu Val Val Ser Lys Lys Leu 835 840 845	2602
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aac cag ata gct cgt gga ttg tgg att ctc tgt cag gca tta gag aat Asn Gln Ile Ala Arg Gly Leu Trp Ile Leu Cys Gln Ala Leu Glu Asn 915 920 925	2842
cca aac tgt aac cta aaa cac cta cgg ttg aag acc tat gaa act aat Pro Asn Cys Asn Leu Lys His Leu Arg Leu Lys Thr Tyr Glu Thr Asn 930 935 940	2890
ttg gaa atc aag aag ctg ttg gag gaa gtg aaa gaa aag aat ccc aag Leu Glu Ile Lys Lys Leu Leu Glu Glu Val Lys Glu Lys Asn Pro Lys 945 950 955 960	2938
ctg act att gat tgc aat gct tcc ggg gca acg gca cct ccg tgc tgt Leu Thr Ile Asp Cys Asn Ala Ser Gly Ala Thr Ala Pro Pro Cys Cys 965 970 975	2986
gac ttt ttt tgc tgagcagcct gggatcgctc tacgaattac acaggaagcg Asp Phe Phe Cys 980	3038
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 <212> PRT  
 <213> Homo sapiens

<400> 13

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			20					25					30		
Pro	Leu	Glu	Asp	Val	Leu	Gln	Lys	Thr	Pro	Trp	Ser	Glu	Val	Glu	Glu
		35					40					45			
Ala	Asp	Gly	Lys	Lys	Leu	Ala	Glu	Ile	Leu	Val	Asn	Thr	Ser	Ser	Glu
	50					55					60				
Asn	Trp	Ile	Arg	Asn	Ala	Thr	Val	Asn	Ile	Leu	Glu	Glu	Met	Asn	Leu
65					70					75					80
Thr	Glu	Leu	Cys	Lys	Met	Ala	Lys	Ala	Glu	Met	Met	Glu	Asp	Gly	Gln
			85						90					95	
Val	Gln	Glu	Ile	Asp	Asn	Pro	Glu	Leu	Gly	Asp	Ala	Glu	Glu	Asp	Ser
		100						105					110		
Glu	Leu	Ala	Lys	Pro	Gly	Glu	Lys	Glu	Gly	Trp	Arg	Asn	Ser	Met	Glu
	115					120						125			
Lys	Gln	Ser	Leu	Val	Trp	Lys	Asn	Thr	Phe	Trp	Gln	Gly	Asp	Ile	Asp
130					135						140				
Asn	Phe	His	Asp	Asp	Val	Thr	Leu	Arg	Asn	Gln	Arg	Phe	Ile	Pro	Phe
145					150					155					160
Leu	Asn	Pro	Arg	Thr	Pro	Arg	Lys	Leu	Thr	Pro	Tyr	Thr	Val	Val	Leu
			165						170					175	
His	Gly	Pro	Ala	Gly	Val	Gly	Lys	Thr	Thr	Leu	Ala	Lys	Lys	Cys	Met
	180						185						190		
Leu	Asp	Trp	Thr	Asp	Cys	Asn	Leu	Ser	Pro	Thr	Leu	Arg	Tyr	Ala	Phe
	195					200					205				
Tyr	Leu	Ser	Cys	Lys	Glu	Leu	Ser	Arg	Met	Gly	Pro	Cys	Ser	Phe	Ala
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Glu	Leu	Ile	Ser	Lys	Asp	Trp	Pro	Glu	Leu	Gln	Asp	Asp	Ile	Pro	Ser
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Glu	Leu	Lys	Val	Pro	Pro	Gly	Ala	Leu	Ile	Gln	Asp	Ile	Cys	Gly	Asp
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	275						280						285		
Arg	Lys	Met	Leu	Pro	Arg	Ala	Ala	Leu	Leu	Val	Thr	Thr	Arg	Pro	Arg
	290					295						300			
Ala	Leu	Arg	Asp	Leu	Gln	Leu	Leu	Ala	Gln	Gln	Pro	Ile	Tyr	Val	Arg
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Val	Glu	Gly	Phe	Leu	Glu	Glu	Asp	Arg	Arg	Ala	Tyr	Phe	Leu	Arg	His
			325						330					335	
Phe	Gly	Asp	Glu	Asp	Gln	Ala	Met	Arg	Ala	Phe	Glu	Leu	Met	Arg	Ser
		340						345					350		
Asn	Ala	Ala	Leu	Phe	Gln	Leu	Gly	Ser	Ala	Pro	Ala	Val	Cys	Trp	Ile
	355						360						365		
Val	Cys	Thr	Thr	Leu	Lys	Leu	Gln	Met	Glu	Lys	Gly	Glu	Asp	Pro	Val
	370				375						380				
Pro	Thr	Cys	Leu	Thr	Arg	Thr	Gly	Leu	Phe	Leu	Arg	Phe	Leu	Cys	Ser
385					390						395				400

Arg	Phe	Pro	Gln	Gly	Ala	Gln	Leu	Arg	Gly	Ala	Leu	Arg	Thr	Leu	Ser	
				405					410					415		
Leu	Leu	Ala	Ala	Gln	Gly	Leu	Trp	Ala	Gln	Met	Ser	Val	Phe	His	Arg	
			420					425					430			
Glu	Asp	Leu	Glu	Arg	Leu	Gly	Val	Gln	Glu	Ser	Asp	Leu	Arg	Leu	Phe	
	435						440					445				
Leu	Asp	Gly	Asp	Ile	Leu	Arg	Gln	Asp	Arg	Val	Ser	Lys	Gly	Cys	Tyr	
	450					455				460						
Ser	Phe	Ile	His	Leu	Ser	Phe	Gln	Gln	Phe	Leu	Thr	Ala	Leu	Phe	Tyr	
465					470				475						480	
Ala	Leu	Glu	Lys	Glu	Glu	Gly	Glu	Asp	Arg	Asp	Gly	His	Ala	Trp	Asp	
			485					490						495		
Ile	Gly	Asp	Val	Gln	Lys	Leu	Leu	Ser	Gly	Glu	Glu	Arg	Leu	Lys	Asn	
			500					505					510			
Pro	Asp	Leu	Ile	Gln	Val	Gly	His	Phe	Leu	Phe	Gly	Leu	Ala	Asn	Glu	
	515						520					525				
Lys	Arg	Ala	Lys	Glu	Leu	Glu	Ala	Thr	Phe	Gly	Cys	Arg	Met	Ser	Pro	
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Asp	Ile	Lys	Gln	Glu	Leu	Leu	Gln	Cys	Lys	Ala	His	Leu	His	Ala	Asn	
545					550				555						560	
Lys	Pro	Leu	Ser	Val	Thr	Asp	Leu	Lys	Glu	Val	Leu	Gly	Cys	Leu	Tyr	
			565					570						575		
Glu	Ser	Gln	Glu	Glu	Glu	Leu	Ala	Lys	Val	Val	Val	Ala	Pro	Phe	Lys	
		580						585					590			
Glu	Ile	Ser	Ile	His	Leu	Thr	Asn	Thr	Ser	Glu	Val	Met	His	Cys	Ser	
	595					600						605				
Phe	Ser	Leu	Lys	His	Cys	Gln	Asp	Leu	Gln	Lys	Leu	Ser	Leu	Gln	Val	
	610					615				620						
Ala	Lys	Gly	Val	Phe	Leu	Glu	Asn	Tyr	Met	Asp	Phe	Glu	Leu	Asp	Ile	
625					630				635						640	
Glu	Phe	Glu	Arg	Cys	Thr	Tyr	Leu	Thr	Ile	Pro	Asn	Trp	Ala	Arg	Gln	
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Asp	Leu	Arg	Ser	Leu	Arg	Leu	Trp	Thr	Asp	Phe	Cys	Ser	Leu	Phe	Ser	
		660						665					670			
Ser	Asn	Ser	Asn	Leu	Lys	Phe	Leu	Glu	Val	Lys	Gln	Ser	Phe	Leu	Ser	
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Asp	Ser	Ser	Val	Arg	Ile	Leu	Cys	Asp	His	Val	Thr	Arg	Ser	Thr	Cys	
	690				695				700							
His	Leu	Gln	Lys	Val	Glu	Ile	Lys	Asn	Val	Thr	Pro	Asp	Thr	Ala	Tyr	
705				710					715						720	
Arg	Asp	Phe	Cys	Leu	Ala	Phe	Ile	Gly	Lys	Lys	Thr	Leu	Thr	His	Leu	
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Thr	Leu	Ala	Gly	His	Ile	Glu	Trp	Glu	Arg	Thr	Met	Met	Leu	Met	Leu	
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Cys	Asp	Leu	Leu	Arg	Asn	His	Lys	Cys	Asn	Leu	Gln	Tyr	Leu	Arg	Leu	
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Leu	Lys	Ala	Asn	Gln	Ser	Leu	Lys	His	Leu	Arg	Leu	Ser	Ala	Asn	Val	
785				790					795						800	
Leu	Leu	Asp	Glu	Gly	Ala	Met	Leu	Leu	Tyr	Lys	Thr	Met	Thr	Arg	Pro	
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Lys	His	Phe	Leu	Gln	Met	Leu	Ser	Leu	Glu	Asn	Cys	Arg	Leu	Thr	Glu	
		820						825					830			
Ala	Ser	Cys	Lys	Asp	Leu	Ala	Ala	Val	Leu	Val	Val	Ser	Lys	Lys	Leu	
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Thr His Leu Cys Leu Ala Lys Asn Pro Ile Gly Asp Thr Gly Val Lys  
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 Phe Leu Cys Glu Gly Leu Ser Tyr Pro Asp Cys Lys Leu Gln Thr Leu  
 865 870 875 880  
 Val Leu Gln Gln Cys Ser Ile Thr Lys Leu Gly Cys Arg Tyr Leu Ser  
 885 890 895  
 Glu Ala Leu Gln Glu Ala Cys Ser Leu Thr Asn Leu Asp Leu Ser Ile  
 900 905 910  
 Asn Gln Ile Ala Arg Gly Leu Trp Ile Leu Cys Gln Ala Leu Glu Asn  
 915 920 925  
 Pro Asn Cys Asn Leu Lys His Leu Arg Leu Lys Thr Tyr Glu Thr Asn  
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 Leu Glu Ile Lys Lys Leu Leu Glu Glu Val Lys Glu Lys Asn Pro Lys  
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&lt;211&gt; 2940

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 14

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aat ctc agt gac aag gaa ttt cag agt ttt aag aag tat ctg gca cgc 96
Asn Leu Ser Asp Lys Glu Phe Gln Ser Phe Lys Lys Tyr Leu Ala Arg
20 25 30

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aag att ctt gat ttc aaa ctg cca cag ttt cca ctg ata cag atg aca 144
Lys Ile Leu Asp Phe Lys Leu Pro Gln Phe Pro Leu Ile Gln Met Thr
35 40 45

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aaa gaa gaa ctg gct aac gtg ttg cca atc tct tat gag gga cag tat 192
Lys Glu Glu Leu Ala Asn Val Leu Pro Ile Ser Tyr Glu Gly Gln Tyr
50 55 60

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ata tgg aat atg ctc ttc agc ata ttt tca atg atg cgt aag gaa gat 240
Ile Trp Asn Met Leu Phe Ser Ile Phe Ser Met Met Arg Lys Glu Asp
65 70 75 80

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ctt tgt agg aag atc att ggc aga cga aac cat gtg ttc tac ata ctt 288
Leu Cys Arg Lys Ile Ile Gly Arg Arg Asn His Val Phe Tyr Ile Leu
85 90 95

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caa tta gcc tat gat tct acc agc tat tat tca gca aac aat ctc aat 336
Gln Leu Ala Tyr Asp Ser Thr Ser Tyr Tyr Ser Ala Asn Asn Leu Asn
100 105 110

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gtg ttc ctg atg gga gag aga gca tct gga aaa act att gtt ata aat	384
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115 120 125	
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Leu Ala Val Leu Arg Trp Ile Lys Gly Glu Met Trp Gln Asn Met Ile	
130 135 140	
tcg tac gtc gtt cac ctc act tct cac gaa ata aac cag atg acc aac	480
Ser Tyr Val Val His Leu Thr Ser His Glu Ile Asn Gln Met Thr Asn	
145 150 155 160	
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Ser Ser Leu Ala Glu Leu Ile Ala Lys Asp Trp Pro Asp Gly Gln Ala	
165 170 175	
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Pro Ile Ala Asp Ile Leu Ser Asp Pro Lys Lys Leu Leu Phe Ile Leu	
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Leu Cys Ser Asn Ser Thr Gln Lys Val Pro Ile Pro Val Leu Leu Val	
210 215 220	
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Ser Leu Leu Lys Arg Lys Met Ala Pro Gly Cys Trp Phe Leu Ile Ser	
225 230 235 240	
tca agg ccc aca cgt ggg aat aat gta aaa acg ttc ttg aaa gag gta	768
Ser Arg Pro Thr Arg Gly Asn Asn Val Lys Thr Phe Leu Lys Glu Val	
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Asp Cys Cys Thr Thr Leu Gln Leu Ser Asn Gly Lys Arg Glu Ile Tyr	
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Phe Asn Ser Phe Phe Lys Asp Arg Gln Arg Ala Ser Ala Ala Leu Gln	
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Leu Val His Glu Asp Glu Ile Leu Val Gly Leu Cys Arg Val Ala Ile	
290 295 300	
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Leu Cys Trp Ile Thr Cys Thr Val Leu Lys Arg Gln Met Asp Lys Gly	
305 310 315 320	
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Arg Asp Phe Gln Leu Cys Cys Gln Thr Pro Thr Asp Leu His Ala His	
325 330 335	

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ctc tat gag aat cgg gaa gaa gaa ttt gtg aag acg att gtg gat gct Leu Tyr Glu Asn Arg Glu Glu Glu Phe Val Lys Thr Ile Val Asp Ala 515 520 525	1584
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565 570 575	
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Ala Ser Gln Met Lys Ser Leu Val Tyr Trp Arg Glu Ile Cys Ser Leu	
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ttt tat aca atg gag agc ctc cgg gag ctg cat atc ttt gac aat gac	1824
Phe Tyr Thr Met Glu Ser Leu Arg Glu Leu His Ile Phe Asp Asn Asp	
595 600 605	
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Leu Asn Gly Ile Ser Glu Arg Ile Leu Ser Lys Ala Leu Glu His Ser	
610 615 620	
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625 630 635 640	
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Gly Phe Glu Asp Leu Leu Lys Ala Leu Ala Arg Asn Arg Ser Leu Thr	
645 650 655	
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Tyr Leu Ser Ile Asn Cys Thr Ser Ile Ser Leu Asn Met Phe Ser Leu	
660 665 670	
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690 695 700	
ctc ctc atc agt ggc ggg agt ctg aga aaa ctg acc tta tcc agc aat	2160
Leu Leu Ile Ser Gly Gly Ser Leu Arg Lys Leu Thr Leu Ser Ser Asn	
705 710 715 720	
ccg ctg agg agc gac ggg atg aac ata ctg tgt gat gcc ttg ctt cat	2208
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725 730 735	
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Pro Asn Cys Thr Leu Ile Ser Leu Val Leu Ser Gly Cys Phe Phe Ser	
740 745 750	
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755 760 765	
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Leu Arg Ser Leu Glu Ile Gly Ser Asn Lys Ile Glu Asp Ala Gly Met	
770 775 780	

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 865 870 875

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 Lys Glu Glu Leu Ala Asn Val Leu Pro Ile Ser Tyr Glu Gly Gln Tyr  
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 Gln Leu Ala Tyr Asp Ser Thr Ser Tyr Tyr Ser Ala Asn Asn Leu Asn  
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 Val Phe Leu Met Gly Glu Arg Ala Ser Gly Lys Thr Ile Val Ile Asn  
 115 120 125  
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 130 135 140  
 Ser Tyr Val Val His Leu Thr Ser His Glu Ile Asn Gln Met Thr Asn  
 145 150 155 160  
 Ser Ser Leu Ala Glu Leu Ile Ala Lys Asp Trp Pro Asp Gly Gln Ala  
 165 170 175  
 Pro Ile Ala Asp Ile Leu Ser Asp Pro Lys Lys Leu Leu Phe Ile Leu  
 180 185 190  
 Glu Asp Leu Asp Asn Ile Arg Phe Glu Leu Asn Val Asn Glu Ser Ala  
 195 200 205

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Ser	Leu	Leu	Lys	Arg	Lys	Met	Ala	Pro	Gly	Cys	Trp	Phe	Leu	Ile	Ser	225	230	235
Ser	Arg	Pro	Thr	Arg	Gly	Asn	Asn	Val	Lys	Thr	Phe	Leu	Lys	Glu	Val	245	250	255
Asp	Cys	Cys	Thr	Thr	Leu	Gln	Leu	Ser	Asn	Gly	Lys	Arg	Glu	Ile	Tyr	260	265	270
Phe	Asn	Ser	Phe	Phe	Lys	Asp	Arg	Gln	Arg	Ala	Ser	Ala	Ala	Leu	Gln	275	280	285
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Phe	Leu	Ala	Asp	Ala	Leu	Thr	Ser	Glu	Ala	Gly	Leu	Thr	Ala	Asn	Gln	340	345	350
Tyr	His	Leu	Gly	Leu	Leu	Lys	Arg	Leu	Cys	Leu	Leu	Ala	Ala	Gly	Gly	355	360	365
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Ser	Leu	Tyr	Cys	Leu	Asp	Tyr	Cys	Cys	His	Leu	Arg	Thr	Leu	Lys	Leu	545	550	555
Ser	Val	Gln	Arg	Ile	Phe	Gln	Asn	Lys	Glu	Pro	Leu	Ile	Arg	Pro	Thr	565	570	575
Ala	Ser	Gln	Met	Lys	Ser	Leu	Val	Tyr	Trp	Arg	Glu	Ile	Cys	Ser	Leu	580	585	590
Phe	Tyr	Thr	Met	Glu	Ser	Leu	Arg	Glu	Leu	His	Ile	Phe	Asp	Asn	Asp	595	600	605
Leu	Asn	Gly	Ile	Ser	Glu	Arg	Ile	Leu	Ser	Lys	Ala	Leu	Glu	His	Ser	610	615	620
Ser	Cys	Lys	Leu	Arg	Thr	Leu	Lys	Leu	Ser	Tyr	Val	Ser	Thr	Ala	Ser	625	630	635
Gly	Phe	Glu	Asp	Leu	Leu	Lys	Ala	Leu	Ala	Arg	Asn	Arg	Ser	Leu	Thr	645	650	655

Tyr Leu Ser Ile Asn Cys Thr Ser Ile Ser Leu Asn Met Phe Ser Leu  
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 675 680 685  
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 690 695 700  
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 725 730 735  
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 740 745 750  
 Ser Asp Ile Cys Gln Tyr Ile Ala Ile Val Ile Ala Thr Asn Glu Lys  
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 770 775 780  
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&lt;210&gt; 17

&lt;211&gt; 2625

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 17

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His Phe Pro Arg Ile Pro Trp Ala Asn Leu Arg Ala Ala Asp Pro Leu
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85 90 95

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Phe	Glu	Val	Asp	Leu	Asn	Ile	Leu	Glu	Asp	Glu	Glu	Leu	Gln	Ala	Ser	
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tca	ttt	tgc	cta	aag	cac	tgt	aaa	agg	tta	aat	aag	cta	agg	ctt	tct	2016
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785 790 795 800	
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 Ser Glu Ser Leu Asp Asp Gly Ser Pro Cys Thr Asp Trp Tyr Gln Glu  
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